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AUTHOR Froese, Victor
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ABSTRACT

A study investigated the encoding and decoding effects in English as a Second Language (ESL) and native English speaking (L1) students in Vancouver, British Columbia (Canada), by isolating the difficulties due to encoding and decoding in these students. The study examined specifically whether there are significant decoding effects based on comparisons between unaided recalls in reading and retelling, and whether there are significant encoding effects based on comparisons between compositions produced through independent writing and oral composing (i.e. dictation). The four "mode" tasks (reading, retelling, writing and oral composing) were administered to 30 each Cantonese, Vietnamese, Punjabi (L2) and native English speakers (L1) ages 9-13. Language competency rather than age was the critical attribute used in selecting the L2 students, who were chosen from ESL classrooms. While results indicated that reading was more difficult than retelling, and independent writing was more difficult than oral composing, only the decoding effects were found to be statistically significant when considering the dependent language variables of WORDS, T-UNITS, and CLAUSES. In addition, no significant differences among the language groups were found. The findings have a potential diagnostic application in first-and second-language instruction. (One table of data and one figure are included; 13 references are attached.) (PRA)

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Dr. Victor Froese
Department of Language Education
University of British Columbia
Vancouver, B.C., Canada
V6T 1Z5
(604) 228-5235

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Encoding & Decoding Effects in ESL and L1 Students[1]

Paper presented at the 40th Annual Meeting of the National Reading Conference
Miami, Florida; December 1, 1990

Background

Due to recent curricular reforms, research, and immigration, a renewed interest in reading-writing relationships has been manifested (Mason, 1989; Stotsky, 1987; Langer, 1986). While Froese (1984; 1987; Schewe & Froese, 1987) has studied the interrelationships of various language modes in L1 and L2 students, little has been done to identify the actual difficulty of the writing (encoding) and reading (decoding) processes themselves, even though "process" is now almost a standard part of the educator's lexicon. This study has built on the previous work mentioned above and has devised sets of language tasks or modes (reading/retelling; independent writing/oral composing) which allow the isolation of the effects due to encoding and decoding. Data were collected for Cantonese, Punjabi, and Vietnamese speakers as well as L1 English students (from the same schools) allowing inferences to be made about ESL as well as native English speakers.

Purpose of Study

The paucity of research dealing with the difficulty of encoding and decoding processes has motivated the current study. The purpose was to use a number of ecologically valid assessment techniques to isolate the difficulties due to encoding and decoding in students from different language groups typically found in metropolitan Vancouver, British Columbia

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schools. The techniques, better referred to as "modes," were labelled reading, retelling, writing, and oral composing and are described in more detail later. A procedural overview is presented in Figure 1. Differences between the first two modes give an indication of decoding difficulty; difference between the second two modes provides an indication of encoding difficulty.

The questions addressed were based on an examination of the dependent variable number of words produced (or WORDS), on the number of clauses produced (CLAUSES), and on the number of t-units observed (T-UNITS) in the retelling or writing of each subject in each of the language groups. The research questions were: (1) Are there significant decoding effects based on comparisons between unaided recalls in reading and retelling? (2) Are there significant encoding effects based on comparisons between compositions produced through independent writing and oral composing (i.e. dictation)?

Methodology

Sample

The four mode tasks were administered to thirty subjects from each linguistic group--Cantonese, Vietnamese, Punjabi (L2) and thirty native English speakers (L1). The L2 subjects were students placed in 14 different ESL classrooms according to school district guidelines, had resided in British Columbia for five or less years, and were between ages of 9 and 13. The L2 subjects essentially exhausted the pool of subjects meeting these criteria. The L1 subjects were randomly selected from three of the same fourteen schools. In short, language competency rather than age or other features was the criterial attribute used in selecting the L2 students. The data were collected by four graduate research assistants who

were trained in the methods developed by Froese (1987), King & Rentel (1981), and Schewe (1986).

Materials

The oral composing samples were based on a common picture stimulus selected from the Interaction materials (Moffett & Wagner, 1973) and were transcribed by the researcher while the student watched the process. The independent writing samples were also based on a common picture stimulus from the same materials but students were expected to write the resulting story themselves. Both activities were preceded by a practise exercise designed to stimulate narrative writing. The reading and retelling exercises were based on well-structured two-episode stories written for this purpose and were of similar readability (i.e. grade 4-5). Unaided retelling in both cases was followed by prompts relative to each story proposition as well as five inferential questions (although the latter data are not reported here). All oral aspects were taperecorded to make cross-checking possible. The specific step-by-step procedures used for each mode were contained in a one-page guide and detailed scoring guides were developed for each mode (available upon request). Approximately 10% of the analyses were scored by a second person and discussed with the original scorer to assure accuracy.

Data Transcription

Data were transcribed and analyzed for common quantitative language units: total number of words produced, words/t-unit, dependent clauses, number of propositions recalled (unaided and aided), type of story elements included (initiating events, setting, etc.), number of inferential questions successfully answered and so on. Five types of miscues were

counted (omission, insertion, repetition, substitution, no pronunciation) but the most common miscue "substitution" was further subcategorized into those classified as reflecting plurals, possessives, -ed endings, tenses, articles, or pronouns. For purposes of this paper only the findings based on total number of words produced, total number of dependent clauses used, and total number of t-units produced are reported. These measures are objective and have been found to be relatively good indicators of language complexity in numerous other studies.

Analysis & Findings

The data, part of a larger study, was collected in 1988, coded and analyzed during 1989, and statistical analysis completed in 1990. Repeated measures ANOVAs (SAS Version 6, 1985) were computed with the between subject factor being "language group" which had four levels (Cantonese, Vietnamese, Punjabi, English), and the within subject factor being "language mode" which had four levels (reading, retelling, writing, dictation). The three dependent variables reported here were: words, t-units, and clauses found in the writing or recall within each task. Since only complete protocols were used, unequal group sizes resulted (see Table 1) and therefore post-hoc multiple comparisons were calculated using non-pooled error terms as suggested by Keselman, Keselman & Shaffer (1990), which results in more robust and hence more accurate tests.

The omnibus repeated measures ANOVAs indicated that there were no significant differences due to groups or due to group x mode interactions for the dependent variables words, t-units, or clauses. However, the main effect due to mode was significant, indicating that collapsed over the language groups, there was a significant difference between the four

modes (i.e. WORDS, $F(3,70) = 10.48$, $p = 0004$; CLAUSES, $F(3,70) = 11.80$, $p = 0002$; T-UNITS, $F(3,70) = 9.12$, $p = 0009$). The p values were adjusted for assumption violations due to unequal group size (Huynh & Feldt, 1976)

Post hoc testing using Bonferroni critical values (.05) indicated that for the dependent variable WORDS, the number of words was significantly larger for retelling, writing, and oral composing than for reading (for all groups). There were no significant differences in WORDS between the retelling, oral composing, and writing across all language groups.

Post hoc testing for the dependent variable CLAUSES indicated that the mean number of clauses was significantly larger in the retelling, oral composing, and writing modes than in the reading mode. The mean number of clauses was significantly larger in both oral composing and writing than in retelling. There was no significant difference in the oral composing and writing modes with respect to mean number of clauses.

For the dependent variable T-UNITS, post hoc testing indicated that the mean number of t-units was significantly higher for the retelling, oral composing and writing modes than for the reading mode. The mean number of t-units was also significantly larger for the writing mode than for the retelling mode. No significant differences in mean t-units for the retelling versus the oral composing, nor for writing versus oral composing were found.

In summary, when considering the dependent variables WORD, T-UNITS, CLAUSES it appears that an important decoding effect has emerged since comparisons were found to be significant for the reading versus retelling effects (WORDS - reading vs retelling, $t = -6.696$, $df = 73.48$, $p < .05$; CLAUSES - reading vs retelling, $t = -5.61$, $df = 72$, $p < .05$;

T-UNITS - reading vs retelling, $t = -5.461$, $df = 84.5$, $p < .05$). However, an encoding effect was not verified since although the means were all in the right direction (i.e. oral composing>independent writing), the comparisons were not statistically significant (WORDS - oral composing vs writing, $t = 1.859$, $df = 30.83$, $p > .05$; CLAUSES - oral composing vs writing, $t = 1.74$, $df = 32.4$, $p > .05$; T-UNITS - oral composing vs writing, $t = 1.250$, $df = 37.59$, $p > .05$).

Discussion

For teaching purposes it is important to know how difficult decoding and encoding processes are. This project sought to identify process difficulty in selected ESL and L1 students. While all the results were in the predicted direction; that is, reading was more difficult than retelling, and independent writing was more difficult than oral composing, only the decoding effects were found to be statistically significant when considering the dependent language variables of WORDS, T-UNITS, and CLAUSES. Perhaps not so predictable is the finding that there were no significant differences among the language groups--whether Cantonese, Vietnamese, Punjabi, or English--at least not when using these dependent variables. However, this study has demonstrated a useful methodology in identifying the difficulty of the processes of encoding and decoding. This finding has a potential diagnostic application in first- and second-language instruction. In-depth analyses of these differences could lead to useful methodological strategies. However, as one of Murphy's Laws (Bloch, 1981, 36) indicates: "Given any problem containing 'n' equations, there will always be 'n+1' unknowns."

References

Bloch, A. (1981). Murphy's Law and other reasons why things go wrong! Los Angeles: Price/Stern/Sloan.

Froese, V. (1984). A comparison of first-graders' ability in three modes of expression: Dictation, independent writing, and story retelling. In Niles, J.A. & Harris, L.A. (Eds) Changing Perspectives on Research in Reading/Language Processing and Instruction. (pp. 288-293). Thirty-third Yearbook of NRC. Rochester, NY: NRC.

Froese, V. (1987). A comparison of ESL students' ability in four language modes: Oral composing, independent writing, story retelling and reading. TESL Canada Journal, 4, 59-72.

Huynh, H. & Feldt, L.S. (1976). Estimation of the box correction factor for degrees of freedom from sample data in the randomized block and split-plot designs. Journal of Educational Statistics, 1, 69-82.

Keselman, H.J., Keselman, J.C. & Shaffer, J.P. (In press, 1990). Multiple pairwise comparisons of repeated measures' means under violation of the multisample sphericity assumption. Psychological Bulletin.

King, M.L. & Rentel, V.M. (1981). How Children Learn to Write: A Longitudinal Study. Columbus, Ohio: Ohio State University Research Foundation.

Langer, J.A. (1988). Children Reading and Writing. Norwood, NJ: Ablex.

Mason, J.M. (Ed.). (1989). Reading and Writing Connections. Boston: Allyn & Bacon.

Moffett, J. & Wagner, B.J. (1973). Interaction: Student-Centered Language Arts and Reading. Boston: Houghton-Mifflin.

SAS/STAT Guide for Personal Computers, Version 6 Edition (1985). Cary, NC: SAS Institute Inc.

Schewe, A. (1986). Relating Reading and Writing: A Study of Fourth-graders' use of Story Schema. Unpublished M.Ed. Thesis, University of Manitoba.

Schewe, A. & Froese, V. (1987). Relating reading and writing via comprehension, quality, and structure. In Readance, J.E. & Baldwin, R.S. (Eds.) Research in Literacy: Merging Perspectives (pp.273-279). Thirty-sixth Yearbook of NRC. Rochester, NY: NRC.

Stotsky, S. (1987). A comparison of the two theories about development in written langauge: Implications for pedagogy and research. In Horowitz, R. & Samuels, S. Jay (Eds.) Comprehending Oral and Written Language. New York: Academic Press.

Figure 1
Procedural Overview of Study

Mode	Stimulus	Response	Analysis
Retelling	Adult reads to subject	Subject retells to different adult	Recalls transcribed & analyzed
Reading	Subject reads independently	Subject retells to adult	Recalls transcribed & analyzed
Writing	Subject views picture	Subject writes independently	Writing is analyzed
Oral Composing	Subject views picture	Subject dictates to adult who writes it down	Writing is analyzed

Table 1

Mean (SD) language units in four modes by language group

Unit	Reading	Retelling	Writing	Oral Composing
		Punjabi N=21		
T-Units	8.19 (4.24)	10.02 (2.56)	13.76 (7.26)	18.62 (23.63)
Words	79.00 (35.22)	87.14 (24.45)	110.29 (62.36)	173.19(220.64)
Clauses	11.81 (6.02)	13.12 (3.36)	17.76 (10.14)	27.19 (37.76)
		Cantonese N=19		
T-Units	7.95 (2.39)	9.37 (2.49)	12.45 (6.51)	13.84 (14.66)
Words	69.47 (22.32)	87.92 (27.30)	108.89 (56.57)	112.26(92.62)
Clauses	10.21 (3.06)	13.26 (4.01)	18.24 (9.97)	19.00 (18.67)
		Vietnamese N=22		
T-Units	9.77 (3.37)	10.20 (2.53)	10.43 (4.44)	12.77 (6.61)
Words	82.18 (28.60)	88.05 (22.42)	90.64 (44.52)	115.05(62.43)
Clauses	13.14 (4.62)	13.39 (3.57)	14.68 (7.30)	18.64 (10.18)
		English N=17		
T-Units	8.59 (2.29)	12.76 (2.91)	14.59 (5.27)	13.47 (6.40)
Words	74.24 (23.09)	116.00(26.02)	131.82(45.57)	138.18(72.05)
Clauses	11.12 (3.12)	17.47 (3.83)	21.47 (8.10)	23.35 (11.47)